

### **REMARKS**

Claims 1-3 were pending in the application and have been amended. New claims 4-17 have been added. Accordingly, claims 1-17 are currently pending in the application and are presented for reconsideration in view of the following remarks.

The Examiner objected to Figures 10C and 11A because of missing/incorrect element numbers and to Figure 6B because of a missing designation; objected to the specification because of informalities; objected to the claims because of informalities; and rejected claims 1-3 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,771,941 to Kim.

This application has been amended by correcting the specification, abstract, and drawings, and presents new claims 4-17. Support for newly added independent claims 4, 5, 11, 12, and 17 can be found for example on pages 10, 15, 18, and 26 of the originally filed specification.

The prior art rejection is traversed. Arguments in support thereof are provided.

It is further respectfully submitted that the within amendments introduce no new matter within the meaning of 35 U.S.C. §132.

### **Drawings**

The Examiner objected to the drawings because element 14 should be labeled in Figure 10C; element 222 in Figure 11A should be 232; and Figure 6B should be designated by a legend such as --Prior Art--.

In response, element 14 has been added to Figure 10C in a corrected drawing sheet in compliance with 37 CFR 1.121(d) and 1.84(c). In Figure 11A, element "222" has been changed to --234-- for numbering consistency rather than --232-- as requested by the Examiner. See

substitute specification. In addition, since Figure 6B is already labeled "Prior Art," Applicant submits that no correction is necessary in compliance with 37 CFR 1.121(d).

Therefore, Applicant respectfully request that the objections to the drawings be withdrawn.

Further corrections to the drawings have been made for example, Figure 1 has been amended to correct the shapes shown for the composite modulated IF signal 10 and the up-converted signal in the RF frequency range 14 such that they are now shown as mirror images of the same width including an audio sub-carrier. Note that the up-converted signal now has the same shape as in Figure 6B.

Figure 2 has been amended to extend the reference number line for the system noise 22 further into the noise area.

Figure 5B has been amended such that the lower side band and upper side bands have a mirror image and the same shapes as in Figure 6B.

Figure 6A has been amended to correct the reference number for the switched bank of filters 53 by changing "67" to --69--.

Figure 6B has been amended to swap the shapes for the lower side band component 71 and the upper side band component 74.

Further, in Figure 11A, previously omitted reference --D2-- has been added under the reference number for the varactor 226; reference --D3-- has been added under the reference number for the varactor 232; reference --D4-- has been added under corrected reference number --234--; and reference number "236" has been replaced with --238-- for the resistor R2.

Furthermore, in Figure 15, previously omitted system designation for amplifier --55f-- has been added. Applicant respectfully submits that these changes to the drawings do not include any new matter.

### **Specification**

The Examiner objected to the disclosure because of informalities in the Brief Description of the Drawings corresponding to Figures 1-4 and 5B-7B; on page 26[sic], line 23; and on page 28, lines 15, and 16[sic].

In response, the Brief Description of the Drawings on pages 20 and 21 has been changed to include --of the prior art-- at the end of the sentences corresponding to Figures 1-4 and 5B-7B. Element "106" has been changed to --110--; the second element "312" has been changed to --313--; and Figure "13" has been changed to --14-- as requested by the Examiner and now shown in the marked and clean copies of the substitute specification. Further, Applicant submits that element "106" does not appear in the original specification on page 28, line 23, and therefore, no correction is needed.

Applicant respectfully submits that typographical errors have also been corrected and additions are made which do not include new matter.

Further, the Abstract has been amended to reduce the word count to 150 words or less.

Accordingly, as all objections have been corrected, Applicant requests that the objection to the disclosure be withdrawn.

### **Claim Objections**

The Examiner objected to claims 1-3 because in claim 1, line 3, "step" should be --steps-- and in line 6, "with" should be --within--. In addition, in claim 3, line 2, "is" should be deleted.

In response, claims 1 has been amended by deleting "step" from the claims and by changing "with" to --within-- as suggested by the Examiner. Further, in claim 3, "is" has been deleted as suggested by the Examiner.

As all objections have been addressed, Applicant respectfully requests that the objection of the claims be withdrawn.

**Claim Rejections - 35 U.S.C. § 103**

The Examiner rejected claims 1-3 as being unpatentable over Kim.

Reconsideration and withdrawal of the rejection is respectfully requested.

To establish a *prima facie* case of obviousness, the Examiner must establish: (1) that some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) that the prior art references teach or suggest all the claim limitations. *Amgen, Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 USPQ 494, 496 (C.C.P.A. 1970).

It is respectfully submitted that Kim fails to teach or suggest all the claim limitations as set forth in independent claims 1, 4, 5, 11, 12, and 17.

Claim 1 recites a combination of features, *inter alia*, attenuating the RF output signal by a factor substantially equal to the gain by adjusting said power level of said IF signal and a level of said RF output signal to produce a desired trade-off between a signal-to-noise ratio and a signal-to-distortion ratio of said RF output signal *while maintaining* a desired constant level of said RF output signal.

Claim 4 recites a combination of features, *inter alia*, adjusting said level of said input signal and said level of said output signal to produce a desired trade-off between a signal-to-

noise ratio and a signal-to-distortion ratio of said output signal *while maintaining* a desired constant level of said output signal.

Claim 5 recites a combination of features, *inter alia*, achieving said desired trade-off between the signal-to-noise ratio and the signal-to-distortion ratio of said output signal for each one of said frequency values of said output signal by controlling said input signal level and said output signal level *while maintaining* a desired constant level of said output signal.

Claim 11 recites a combination of features, *inter alia*, a filter for adjusting said level of said input signal and said level of said output signal to produce a desired trade-off between a signal-to-noise ratio and a signal-to-distortion ratio of said output signal *while maintaining* a desired constant level of said output signal.

Claim 12 recites a combination of features, *inter alia*, attenuating the converted output for each of the plurality of modulation signals to produce a desired trade-off between a signal-to-noise ratio and a signal-to-distortion ratio of said output signal *while maintaining* a desired constant level of said output signal.

Claim 17 recites a combination of features, *inter alia*, a third controller for achieving a desired trade-off between the signal-to-noise ratio and the signal-to-distortion ratio of said output signal for each one of said frequency values of said output signal by controlling said input signal level and said output signal level *while maintaining* a desired constant level of said output signal.

Kim discloses a transmission power control apparatus of a base station of a mobile communications network. The reference discusses a method of controlling the RF output level in a way that tracks the input IF signal level, which is an automatic gain controller (AGC) function. Kim accomplishes this by comparing the RF level with the input IF signal level in an AGC controller unit 205, which compares the RF signal against the IF signal and outputs a

signal controlling an RF attenuator 203, thus affecting the gain of the up-converter 201 to achieve desired RF output level. See column 4, lines 20-34.

The Examiner asserts that Kim does not disclose that the attenuating factor used in the second attenuator (8) is substantially equal to the gain of the first attenuator (3) and/or the amplifier (4); nor that the gain would be nominal when one or more of the distortion components cannot be filtered. Therefore, the Examiner concludes that:

“it would have been obvious...to modify Kim to attenuate the signal by the same amount as the gain because one...would want to control the RF signal to have a suitable level of power or strength. In addition, it would have been obvious...that the gain would be nominal whenever at least one of the one or more distortion components could not be filtered, again because one...would want to control the RF signal power level.”

Applicant does not claim that the control of the RF signal power level by RF or IF attenuators, or by the combination of the two is novel. Many RF devices involving frequency conversion (both transmitters and receivers) utilize both IF and RF attenuation for signal level control. An example is a television (TV) tuner or a cellular phone, typically having automatic gain control (AGC) in both IF and RF sections. Further, Applicant does not claim RF level control or AGC aspects of using the attenuators in the instant application.

What is novel is the simultaneous change of both IF and RF attenuation in the opposite directions, for a net zero level change (i.e., IF-RF level exchange). The corresponding claim language in each of the independent claims is:

“...desired trade-off between a signal-to-noise ratio and a signal-to-distortion ratio of said output signal...*while maintaining* a desired constant level of said output signal.”

Applicant asserts that the novelty in the subject invention is the way and the purpose of using the two attenuators in conjunction with each other. Applicant respectfully submits that

simultaneous change of two attenuators in opposite directions is not obvious from the prior art. In fact, it may look meaningless – why would one make a simultaneous change of the gain (or attenuation) of two devices in opposite directions, with no net gain change?

The simultaneous action of two attenuators in opposite directions clearly does not serve the purpose of controlling the signal level. The purpose is rather to control the amount of distortion and noise levels passed at the RF output. This is achieved in the present invention by setting the IF and RF attenuation to optimum positions (optimum "exchange"), while maintaining a constant system gain. The design criteria for setting the optimum exchange rate is derived from two considerations - one, considering distortion terms (single unit issue), and second, considering aggregation of noise from multiplicity of up-converter units (system issue). Each unit is optimized for its own minimum distortions, as well as for minimum system noise, on a per-channel basis.

Thus, it is therefore respectfully submitted the claimed method is materially different from the cited reference. Accordingly, as the Kim patent does not teach or suggest all of the claim limitation of the present invention; Applicant respectfully submits that the claims as presently presented patentably define over Kim taken alone or in combination.

Therefore, Applicant requests that the rejection of independent claim 1 under 35 USC 103(a) be withdrawn. Further, the rejection of the dependent claims 2 and 3 should be withdrawn for at least similar reasons discussed in detail above with reference to claim 1.

Further, Applicant respectfully submits that new claims 4-17 are allowable at least for similar reasons as discussed regarding claim 1.

### **Conclusion**

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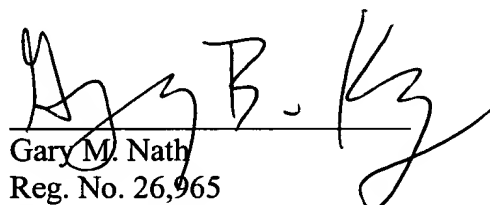
In light of the foregoing, Applicant submits that the application is now in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicant respectfully requests that the Examiner contact the undersigned attorney if it is believed that such contact will expedite the prosecution of the application. Favorable action with an early allowance of the claims is earnestly solicited.

Respectfully submitted,

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